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10/666,518	09/19/2003	Mitsuru Mimori	5405-8	9176

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COHEN, PONTANI, LIEBERMAN & PAVANE LLP
551 FIFTH AVENUE
SUITE 1210
NEW YORK, NY 10176

EXAMINER
CHOW, VAN NGUYEN

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _08 October 2008_.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-21, 27-47_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-21 and 27-47_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some *   c)☐ None of:

      1. ☒ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/08/2008 has been entered.

Response to Arguments

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-14, 16-18, 20-21, 27-34, 36-39, 41-44, 46-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over US. Patent 6,687,209 (hereafter Ota.) in view of Shimano US 6,717,906.

Regarding claim 1, Ota discloses the invention as claimed, an optical element [see Figs. 1-6,] including a diffractive structure, and ring-shaped zones, comprising:

a diffractive structure [fig. 1 and 6, surface 11, 12, 13] having a plurality of diffracting ring-shaped zones arranged around an optical axis on at least one optical surface; and an optical path difference giving structure [fig. 1, unit 13a] arranged on an optical surface of at least one of the plurality of diffracting ring-shaped zones, for giving a prescribed optical path difference to a prescribed light beam passing through the diffracting ring-shaped zone,

wherein the diffractive structure emits an L-th (L≠0) order diffracted light with a larger light amount than any other diffractive light, when the light beam having the first wavelength)d passes through the diffractive structure, which emits an M-th (M≠0) order diffracted light with a larger light amount than any other diffractive light, when the light beam having the second wavelength λ2 passes through the diffractive structure [col. 15, lines 1- 33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

Shimano Fig. 34 discloses an optical path difference giving structure is superimposed on a diffractive structure so that at least one stepped shape of the optical path difference giving structure is disposed inside the boundary of the optical surface of at least one of the plurality of diffracting zones.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a diffractive structure in Ota as suggested by Shimano, the motivation being in order to reduce the spherical aberration and the coma aberration (see Shimano col. 17).

Regarding claims 2-5, the combination of Ota and Shimano, discloses the optical element of claim 1, wherein as compared with the diffractive structure when the optical path difference giving structure is not provided on the optical surface of the diffractive structure, the optical path difference giving structure lowers an absolute value of an optical phase difference between the L-th order diffracted light of the light beam having the first wavelength λ1 and the M-th order diffracted light of the light beam having the second

wavelength λ 2 by *substantially giving no change of a phase* or *changing a phase of at least* or by *giving a phase difference to both* or by *giving an optical path difference approximately equal to an integral multiple having* of one of the L-th order diffracted light of the light beam having the first wavelength λ 1and the M-th order diffracted light of the light beam having the second wavelength λ 2 and by giving a phase difference to the other of the L-th order diffracted light of the light beam having the first wavelength λ1 and the M-th order diffracted light having the light beam having the second wavelength λ2, the L-th order diffracted light and the M-th order diffracted light being caused by the diffractive structure [see Ota col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

Regarding claim 6, the combination of Ota and Shimano, discloses the optical element of claim 1, wherein the optical path difference giving structure sets the absolute value of the optical phase difference to a value lower than 0.6.pi. radians [see Ota fig. 9] [col. 22, line 66 to col. 23, line 42].

Regarding claims 7-8, the combination of Ota and Shimano, discloses the optical element of claim 1, wherein the diffractive structure is a serrate shape or stepped shape, and the optical path difference giving structure is a stepped shape [see Ota col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

Regarding claims 9-10, the combination of Ota and Shimano, discloses the optical element of claim 1, wherein the optical surface comprises a central region arranged around the optical axis and formed in an approximately circular shape, and a peripheral region arranged at a periphery of the central region, the diffractive structure and the optical path difference giving structure are provided in the central region, and the diffractive structure formed in a serrate shape or optical path difference giving structure is provided in the peripheral region or a refractive structure for refracting a light beam is arranged in the peripheral region

[see Ota col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

Regarding claims 12-13, 29-32, the combination of Ota and Shimano, discloses the optical element of claim 1, wherein L=M=1 or L=N, M=N or L=M=N is satisfied [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to [see Ota col. 24, line 38; and figs. 1, 3 & 6 and see fig. 34; & col. 17, line 11 to col. 18, line 15; surfaces 1A & 1B].

NOTE: Equal steps satisfies L=M or L=N.

Regarding claim 14, the combination of Ota and Shimano, discloses the optical element of claim 1, wherein the number of the discontinuous surfaces, which are formed in a stepped shape along a direction of the optical axis and composes the optical path difference giving structure, is 2 or 3 [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1,3 &6].

Regarding claim 16, the combination of Ota and Shimano, discloses the optical element of claim 1, wherein   the diffractive structure sets a sum of a diffraction efficiency of the L-th order diffracted light of the light beam having the first wavelength lambda1 and a diffraction efficiency of the M-th order diffracted light of the light beam having the second wavelength lambda2 to 170% or less, and the optical path difference giving structure heightens the sum of the diffraction efficiency of the L-th order diffracted light of the light beam having the first wavelength lambda1 and the diffraction efficiency of the M-th order diffracted light of the light beam having the second wavelength lambda2 by 10% or more [see Ota col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

Regarding claims 17, 33, 38 and 43, the combination of Ota and Shimano, discloses the optical element of claim 1, wherein the light beam having the first wavelength lambda1 and the light beam having

the second wavelength lambda2 are respectively incident on the optical surface as a diverging light beam, and the light beam having the first wavelength ~ and the light beam having the second wavelength ~2 are converged on a prescribed optical information recording medium in a condition that at least one of a spherical aberration and a wave front aberration are corrected [col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

Regarding claims 18, 34, 39 and 44, the combination of Ota and Shimano, discloses the optical element of claim 1, wherein a magnification m satisfies a formula:-0.295 = m = -0.049 [see Ota col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

Regarding claims 20 and 41, the combination of Ota and Shimano, discloses the optical element of claim 1, wherein the first wavelength lambda1 and the second wavelength lamdba2 are a use reference wavelength corrected [see Ota col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

Regarding claims 21 and 42, the combination of Ota and Shimano, discloses the optical element of claims 20 and 41, respectively, wherein the optical path difference giving structure gives an optical path difference to the diffracted light so that a -N-th order diffracted light of the light beam having the use reference wavelength lambda1 has a maximum diffraction efficiency and so that a (-N+l)-th order diffracted light of the light beam having the use reference wavelength lambda2 or a (-N-1)-th order diffracted light of the light beam having the use reference wavelength lambda2 has a maximum diffraction efficiency [see Ota col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

Regarding claim 27, the combination of Ota and Shimano, discloses the optical element of claim 1, wherein the number of diffracting ring-shaped zones is from 3 to 20 [see Ota col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

Regarding claim 28, the combination of Ota and Shimano, discloses the optical element of claim 20, wherein the optical path difference giving structure gives an optical path difference equal to an integral multiple of the use reference wavelength lambda2 to the light beam having the use reference wavelength lambda2 [see Ota col. 15, lines 1-33; col. 17, line 61 to col. 18, line 21; col. 23, line 49 to col. 24, line 38; and figs. 1, 3 & 6].

Regarding claims 36-37, see rejection above of claims 1-2, respectively and see Ota fig. 3.

Regarding claims 46-47, the combination of Ota and Shimano, discloses the optical element of claim 1, wherein the optical element is an objective element and the optical path difference giving structure is arranged on an optical surface of at least one if the plurality of different ring-shaped zones [see Ota Figs.1-6 and Shimano Figs. 34-35].

Claims 15, 19, 35, 40 and 45 are rejected under 35 U.S.C. § 103(a) as being unpatentable over US. Patent 6,687,209 (hereafter Ota.) and Shimano US 6,717,906 as applied to claims 1-14, 16-18, 20-34, 36-39, 41-44 above.

Regarding claim 15, although Ota and Shimano do not specifically disclose that the first wavelength lambda1 satisfies 370 nm< = lambda1<= 430 nm. Ota does teach that one of the wavelengths [second wavelength] is 655 +- 30 nm. Ota teaches that his diffractive element is useful for DVD and CD. Even thought Ota does not disclose use of blue laser wavelength of 370 to 430 nm, these are well known in the art for long time.

The limitations in claim 15 do not define a patentable distinct invention over that in Ota since both the invention as a whole and Ota are directed to using a diffractive element for use with two different wavelength lasers. The use of higher wavelength presents no new or unexpected results, so long as the diffractive element with step function which is an optical path giving structure and allows read/write on high

density disc and also CD disc in a successful way. If one has less density requirement one use lower wavelength and one needs more density one use higher wavelength. Therefore, to have exactly wavelength between 370 and 430 nm would have been routine experimentation and optimization in the absence of criticality. And also this would be the logical steps in the evolution of the DVD art.

37. Regarding claims 19 & 35, although Ota does not specifically disclose that the curvature radii R1 & R2 satisfies -3.2 <R2/R1<-1.9 to the extent claimed.

Ota teaches different radii for different regions and sides. The limitations in claim 10 do not define a patentable distinct invention over that in Ota since both the invention as a whole and Ota are directed to removing aberrations in CD and DVD and use single structure to read CD and DVD with a single system in the optical pickup. The degree in which the ration R2/R1 is defined presents no new or unexpected results, so long as the optical pickup can read CD and DVD with minimum aberration. Therefore, to have the ratio satisfy -3.2 <R2/R1<-1.9 with respect to diffraction element in an optical pickup would have been routine experimentation and optimization in the absence of criticality.

As to claims 40 & 45, Ota teaches multiple light sources. Ota does not specifically teach a third light source for third thickness. "Official Notice" is taken that both the concept and the advantages of providing a third light source are well known and expected in the art. It would have been obvious to include third light source to Ota as this extra light source is are known to provide higher usefulness in the same system and thereby saving time and money while trying to read disc of third thickness type. These concepts are well known in the art and do not constitute a patentably distinct limitation, per se [M.P.E.P. 2144.03].

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Van N. Chow whose telephone number is (571)272-7590. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne R. Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Van N. Chow/
Examiner, Art Unit 2627

/Wayne Young/
Supervisory Patent Examiner, Art Unit 2627